

1. A system for expressing a heterologous gene in a cell type-specific and inducible manner, the system comprising at least one vector comprising a nucleic acid encoding a switch/biosensor, a nucleic acid encoding a tissue-specific promoter, a nucleic acid encoding the heterologous gene, and a nucleic acid encoding a gene amplification component, wherein the switch/biosensor allows the system to regulate expression of the heterologous gene in response to a stimulus, the tissue-specific promoter allows the system to selectively express the heterologous gene in a particular cell type, and the gene amplification component induces expression of the heterologous gene at a level sufficient to exert a detectable physiological effect on a cell administered the system.

2. The system of claim 1, wherein the at least one vector comprises an rAAV vector.

3. The system of claim 1, wherein the at least one vector comprises at least a first rAAV vector and a second rAAV vector.

4. The system of claim 3, wherein the first rAAV vector comprises the nucleic acid encoding the switch/biosensor.

5. The system of claim 4, wherein the switch/biosensor comprises an oxygen-dependent degradation domain.

6. The system of claim 3, wherein the first rAAV vector comprises the nucleic acid encoding the tissue-specific promoter.

7. The system of claim 6, wherein the tissue-specific promoter comprises a cardiac-specific promoter.

8. The system of claim 7, wherein the cardiac-specific promoter is MLC-2v.

9. The system of claim 1, wherein the gene amplification component comprises a transactivator and a regulatory element responsive to the transactivator, wherein the regulatory element is operatively linked to the heterologous gene, and wherein binding of the transactivator to the regulatory element increases expression of the heterologous gene.

10. The system of claim 9, wherein the transactivator comprises a GAL4 DNA-binding domain.

11. The system of claim 10, wherein the transactivator further comprises a p65 activation domain.

12. The system of claim 10, wherein the regulatory element comprises a GAL4 UAS.

13. The system of claim 11, wherein the regulatory element comprises a GAL4 UAS and an Ad E1b TATA element.

14. The system of claim 9, wherein the switch/biosensor comprises an oxygen-dependent degradation domain, the tissue-specific promoter comprises a cardiac-specific promoter, the transactivator comprises a GAL4 DNA-binding domain and a p65 activation domain, the regulatory element comprises a GAL4 UAS and an Ad E1b TATA element.

15. The system of claim 14, wherein the cardiac-specific promoter is MLC-2v.

16. The system of claim 14, wherein the switch/biosensor, the tissue-specific promoter, and transactivator are encoded by nucleic acids comprised on a first rAAV vector, and the regulatory element and the heterologous gene are encoded by nucleic acids comprised on a second rAAV vector.

17. The system of claim 16, wherein the system comprises a third rAAV vector that comprises the regulatory element operably linked to a transgene differing from the heterologous gene.

5 18. The system of claim 1, wherein the system is comprised in at least one cell.

19. The system of claim 18, wherein the cell is in an animal subject.

10 20. A method for expressing a heterologous gene in a cell in a cell type-specific and inducible manner, the method comprising administering to the cell at least one vector comprising a nucleic acid encoding a switch/biosensor, a nucleic acid encoding a tissue-specific promoter, a nucleic acid encoding the heterologous gene, and a nucleic acid encoding a gene amplification component, wherein the switch/biosensor allows the system to regulate expression of the heterologous gene in response to a stimulus, the tissue-specific promoter
15 allows the system to selectively express the heterologous gene in a particular cell or tissue type, and the gene amplification component induces expression of the heterologous gene at a level sufficient to exert a physiological effect on a cell administered the system.

20 21. The method of claim 20, wherein the cell is a cardiac myocyte.

22. The method of claim 20, wherein the cell is in an animal subject.